The development of the AUMDROID application (an android-based problem expression tool)

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Abstract: *This study aims to investigate the needs, produce a prototype, and determine the validity and practicality of the AUMDROID application for students of SMKN (State Vocational High School) 10 Makassar. The respondents were six school counselors and twenty-five eleventh-grade TELI 1 students. A research and development (R&D) framework was adopted to conducted this study. Observations, interviews, as well as validity and product testing questionnaires were performed to collect the data. Descriptive quantitative analysis was performed to analyze the data. Results showed that the AUMDROID application was needed at SMKN 10 Makassar to facilitate and streamline the processes of guidance and counseling assessment, as well as the needs analysis of problems faced by students. The prototype of the AUMDROID application was developed by designing the Problem Expression Tool (AUM) based on the Student Independence Competency Standards (SKKPD) and developmental tasks. The developed AUMDROID application is valid and feasible for use at SMKN 10 Makassar. The AUMDROID application is practical due to its convenience and accessibility at all times and in any location.*

Keywords: R&D; application; AUMDROID; AUM; android.

Abstrak: Penelitian ini bertujuan untuk mengetahui gambaran kebutuhan, menghasilkan prototipe, dan untuk mengetahui validitas dan kepraktisan pengembangan aplikasi AUMDROID untuk siswa SMK Negeri 10 Makassar. Subjek dalam penelitian ini adalah 6 guru BK dan 25 siswa kelas XI TELI 1. Jenis penelitian ini adalah penelitian dan pengembangan. Instrumen penelitian yang digunakan dalam penelitian ini, yaitu observasi, wawancara dan angket yang terdiri dari angket validasi dan angket uji coba. Teknik analisis data yaitu analisis deskriptif kuantitatif. Hasil penelitian menunjukkan sesuai dengan keadaan di SMK Negeri 10 Makassar, maka dibutuhkan pengaplikasian software aplikasi AUM berbasis android di SMK Negeri 10 Makassar, karena aplikasi ini dapat memberikan kemudahan dan kelancaran dalam proses asesmen bimbingan dan konseling serta dapat digunakan secara praktis dalam proses analisis kebutuhan tentang masalah yang dialami peserta didik. Prototipe pengembangan yang dihasilkan berupa desain produk aplikasi AUMDROID dengan menyusun instrumen AUM yang telah disesuaikan dengan SKKPD dan tugas perkembangan. Aplikasi AUMDROID yang dikembangkan telah valid yaitu sangat baik sehingga layak untuk digunakan di SMK Negeri 10 Makassar. Aplikasi AUMDROID praktis karena kemudahan dalam penggunaan dan dapat diakses kapan saja dan dimana saja.

Kata kunci: *R&D; aplikasi; AUMDROID; AUM; android.*

INTRODUCTION

Advances in digital technology are currently driving innovation across diverse scientific disciplines (Kusnandi, 2019). This innovation is achieved by developing products that contribute to scientific knowledge (Rahmi Ramadhani, 2020). The use of technological devices as the information broadcast media cannot be discontinued. In this era of globalization, advanced information and communication technology should be optimized, particularly for providing students with guidance and counseling services (Ilfana, 2022). Many teachers believe that particular lessons or fields of study cannot utilize instructional media (Ilfana & Herdi, 2022).

However, teachers across all fields of study, including school counselors, can leverage media to facilitate the effective dissemination of knowledge and enhance students' understanding (Ilfana & Herdi, 2022). Guidance and counseling services should adapt to technological advances to develop diverse service formats, fostering a harmonious integration between these services and technology (Istiâ et al., 2021; Evianti, Subekti, & Firmansyah, 2020)

Information technology is a crucial factor in guidance and counseling services (Prasetiawan & Alhadi, 2024; Abdillah, 2022; Imawanty & Fransiska, 2019). The use of information technology allows school counselors to creatively and innovatively access up-to-date information. Optimal utilization of technology can help school counselors achieve favorable outcomes in their services (Triyono & Febriani, 2018).

With technology, school counselors are able to provide more effective and efficient services (Daulay, 2019). The aim of leveraging technology in guidance and counseling is to create a system that is convenient, manageable, simple, and dynamic (Setyana & Purwoko, 2018). (Imawanty & Fransiska, 2019) state that guidance and counseling assessments can incorporate both test and non-test techniques. School counselors often use the non-test technique due to its straightforward and learnable procedures. There are several forms of the non-test technique, such as guided interviews, observations, and questionnaires (Asmadin & Silvianetri, 2022). The Problem Expression Tool (AUM) is an important instrument in the process of guidance and counseling assessments (Safithry, 2018). The General AUM, initially developed by (Hariyanto & Mustafa, 2020), has been recently updated into a digital application aimed at assisting school counselors in identifying students' problems (Ifdil & Ilyas, 2018; Wahidah, Cuntini, & Fatimah, 2019)

The AUM commonly used by school counselors is still manual and outdated because it relies on paper-based formats and contains a lengthy list of statements concerning various problems (Ifdil, Sin, & Fadli, 2021). This type of AUM causes boredom among students and takes longer to complete. Thus, it is necessary for school counselors to incorporate technology in delivering effective guidance and counseling services.

The current AUM application is impractical for school counselors with low proficiency in Excel and hence requires further development. According to (Setyana & Purwoko, 2018), the process of inputting data requires caution, as small mistakes can affect the validity of the assessments. McGannon, as cited by (Setyana & Purwoko, 2018), emphasizes that an instrument should not be used without evidence of its validity.

Results of interviews with the school counselors at SMKN (State Vocational High School) 10 Makassar revealed that no specific time was allocated for classroom-based guidance and counseling services, posing a challenge for administering the assessments. A proper instrument is crucial in collecting data on student needs, which can then be used to design effective and efficient guidance and counseling services Therefore, the development of a product to facilitate the process of guidance and counseling services is indispensable.

The researchers were interested in utilizing technology to improve the processing of the AUM instrument. This led to the development of the AUMDROID application, which is an Android-based problem expression tool. AUMDROID offers several advantages over the General AUM for high schools.

Replacing the paper-based version with smartphones for answering questions can alleviate students' boredom. Also, AUMDROID comprises only 100 problem items, significantly fewer than the General AUM for high schools, which contains 225 problem items. The questions, answers, and directions for use are distributed via Android-based smartphones instead of print-out paper. AUMDROID enables real-time processing and analysis of answers, a significant advantage over the General AUM for

high schools, which requires more time to process and analyze answers using Excel.

Furthermore, AUMDROID integrates answers and reports from individual students and groups.

This study aims to investigate the needs, produce a prototype, and determine the validity and practicality of the AUMDROID application for students of SMKN 10 Makassar.

METHOD

1. Research Design

This study was conducted within the framework of Research and Development (R&D) developed by Borg & Gall.

2. Development Procedures

The development of the AUMDROID application involved a series of structured steps. According to Sugiyono (2014), there are 10 stages of R&D, namely:1) potential and problem expression, 2) data collection, 3) product design, 4) design validation, 5) design revision, 6) product testing, 7) product revision, 8) field testing, 9) product revision, and 10) mass production. This study, however, reduced these stages to eight to better suit field conditions.

3. Location and Subjects of the Study

The study was conducted at SMKN 10 Makassar, located at Bonto Manai Street No. 14, Manuruki, Tamalate from February 1 to 21, 2023. The subjects of the study consisted of six school counselors and twenty-five eleventh-grade TELI 1 students.

4. Data Collection

The following are the techniques used to collect the data for the development of the AUMDROID application.

a. Library Research

Information related to research topics or problems was collected from various sources, including books, scientific journals, research reports, and regulations in both printed and electronic forms.

b. Observations and Interviews

Observations and interviews were performed in the preliminary research to identify the problem to be studied and to collect additional information. School conditions were identified through observations, while questions and answers were conducted with sources through interviews.

c. Questionnaires

The experts and respondents were asked to fill in the questionnaires used to assess the validity and practicality of the AUMDROID application.

5. Data Analysis

The data of the study were analyzed using descriptive quantitative analysis. Data from the expert validation and product testing questionnaires were processed using percentages. The formula used to calculate the percentage is:

$$P = \frac{\sum x}{SMI} \times 100\%$$

Description:

P : Percentage (%)
$\sum x$: Total Score
SMI : Ideal Maximum Score

$$P = \frac{F}{N}$$

Description:

P : Percentage (%)
F : Total Percentage of the Subjects of the Study
N : The Number of the Subjects

Descriptive analysis was performed to measure the validity and practicality of the AUMDROID application. The levels of achievement were measured using a scale of 1-5, where the conversion guidelines are as follows:

Table 1. Conversion of Achievement Levels Using a 5-Point Scale

Level of Achievement	Qualification	Meaning
90%-100%	Very Good / Highly valid	No revisions needed
75%-89%	Good / Valid	Minor revisions needed
65%-74%	Adequate / Sufficiently valid	Moderate revisions needed
55%-64%	Poor / Invalid	Extensive revisions needed
0%-54%	Very poor / Highly invalid	Complete revisions needed

RESULTS AND DISCUSSION

1. The Description of the Needs to Develop the AUMDROID Application for the Students of SMKN 10 Makassar

a. Potential and Problem

The results of preliminary observations and interviews revealed that the AUM application was not optimally used for the assessment process

of guidance and counseling at SMKN 10 Makassar. This situation may lead to some negative consequences as it does not align with rapid technological advancements. Despite the difficulties the school counselors faced due to the manual assessment process, the school has some potentials. It provides internet access and its counselors are adept at using Android-based smartphones. Given the situation, an Android-based AUM application was needed to streamline the process of assessment and analysis of students' problems.

b. Data Collection

Data on the potential and challenges found in SMKN 10 Makassar were collected. At this stage, the data were analyzed, the supportive devices were evaluated, and the flowchart and storyboard for the application were created.

In their study, Setyana & Purwoko (2018) developed a similar application for SMAN (State High School) 1 Gedangan based on the Borg and Gall development model. The application met the acceptability criteria. Therefore, the current study used it as a reference for the product development at SMKN 10 Makassar.

2. The Prototype of the AUMDROID Application for the Students of SMKN 10 Makassar

a. Designing the AUMDROID Application

The application was designed on a computer with Google Site as a dashboard. At this stage, the application was connected to the emulator to evaluate the application's interface and functionality. This stage consisted of: 1). The planning for the AUM instrument based on the SKKPD and developmental tasks, which were integrated to Google Form. Simplifying AUM based on the eleven developmental tasks: originally, AUM had 225 problem items across 10 categories, while it has now been reduced into 100 problem items across 7 categories.

1) Creating the front page based on the predefined flowchart and storyboard.
2) Creating a formula on Google Sheet to analyze and edit students' responses.
3) Integrating Google Form with Google Site.
4) Connecting Google Sheet with Google Site.
5) Configuring the application setting.
6) Selecting the design and theme.
7) Setting and adding content.

8) Developing the application on appsgeyser.com.
9) Installing the application on the emulator.
10) Checking and evaluating the application.

b. Designing the Validity Instrument

The validity instrument for the AUMDROID application was established based on its design and content. The AUMDROID application was assessed using a scale, with each indicator receiving a score. A design expert and a material expert were asked to assess the validity of the application. The experts evaluated the appearance and content of the application to determine whether the AUMDROID application met the criteria for product testing.

c. Designing the Product Testing Instrument

The instrument for product testing was designed to test the practicality of the AUMDROID application. A scale was used and two validation experts were asked to assess the practicality indicators. The subjects of the study were also asked to evaluate the practicality of the AUMDORID application to determine whether it was practical for use at SMKN 10 Makassar.

The prototype of the AUMDROID application for the students of SMKN 10 Makassar was designed based on the study by Setyana & Purwoko (2018) who explained the stages of a product development, namely planning for and composing a material draft, a media draft, instructions for use, and evaluation instruments.

3. The Validity and Practicality of the AUMDROID Application for the Students of SMKN 10 Makassar

a. Design Validity

The validity of the design and content of the AUMDROID application was assessed before product testing. The design and material experts reviewed the application by giving scores to the relevant indicators. The instrument for product testing was also validated at this stage. After validation, an analysis was conducted on the feedback provided by the experts.

1) Results of Expert Validation on the Application's Design

The design expert reviewed the appearance of the AUMDROID application and confirmed that it was valid, required no revisions, and ready for product testing.

Table 2. Results of Expert Validation on the Application's Design

No	Indicator	Score	Qualification
1.	Ease of accessing the AUMDROID application on a smartphone	5	Very Valid
2.	Completeness of the menu/navigation	5	Very Valid
3.	Clarity of the menu/navigation	5	Very Valid
4.	Suitability of menu/navigation names with the displayed information	5	Very Valid
5.	Practicality in using the AUMDROID application	5	Very Valid
6.	Accuracy of the AUMDROID application home page layout	5	Very Valid
7.	Accuracy of display design color selection	5	Very Valid
8.	Accuracy of typeface choice	5	Very Valid
9.	Accuracy of font size selection	5	Very Valid
10.	Accuracy of background color selection	5	Very Valid
11.	Harmony between letter color and background color	5	Very Valid
12.	Accuracy of menu layout settings	5	Very Valid
13.	Clarity of images in the AUMDROID application	5	Very Valid
14.	Accuracy of image size displayed	5	Very Valid
15.	Display of the presented information	5	Very Valid
16.	Display of the access menu for students	5	Very Valid
17.	Display of the access menu for school counselors	5	Very Valid
18.	Display of the user instructions menu	5	Very Valid
19.	Display of the info menu	5	Very Valid
20.	Overall view of the AUMDROID application	5	Very Valid
	Total Score	**100**	
	Percentage	**100%**	

2) Results of Expert Validation on the Product Testing Instrument

Table 3. Results of Validation on the Product Testing Instrument for School Counselors

No	Indicator	Score	
		Validator 1	Validator 2
1.	I find it very easy to understand the AUMDROID application.	5	5
2.	I find it very easy to use the AUMDROID application.	5	5
3.	I find it very easy to access the AUMDROID application at any time.	5	5
4.	I find it very easy to access the AUMDROID application from anywhere.	5	5
5.	I find the AUMDROID application helpful.	5	5
6.	I find it very easy to access the AUMDROID application on my smartphone and tablet.	5	5
7.	I feel very satisfied with the complete menu featured in the AUMDROID application.	5	5
8.	I can save time when conducting assessments using the AUMDROID application.	5	5
9.	I can save energy when conducting assessments using the AUMDROID application.	5	5
10.	I can save money when conducting assessments using the AUMDROID application.	5	5
11.	I feel very satisfied with the design and material of the AUMDROID application.		
12.	Overall, I feel very satisfied with the AUMDROID application		
Total Score		**50**	**50**
Percentage		**100%**	**100%**
Overall Percentage		**100%**	

Two experts performed validation on the instrument that was later used to test the application at SMKN 10 Makassar. This instrument was designed for the school counselors and students, considering the varying levels of familiarity with the product being developed. The validation was conducted to assess the feasibility of the instrument before use. Validation results showed that the product testing instrument for school counselors and students was valid and feasible, as both validators gave it a score of 100.

3) Results of Expert Review on Material Validity

The material expert reviewed the content of the AUMDROID application and confirmed that it was valid, required no revisions, and ready for product testing.

Table 4. Results of Expert Validation on the Application's Content

No.	Indicator	Score	Qualification
1.	Ease of understanding the information content in the AUMDROID application	4	Very Valid
2.	Use of proper and correct Indonesian	5	Very Valid
3.	Use of easily understandable grammar	5	Very Valid
4.	Completeness of the student personal data menu in the AUMDROID application	5	Very Valid
5.	Completeness of the personal information section in the AUMDROID application	5	Very Valid
6.	Completeness of the social information section in the AUMDROID application	5	Very Valid
7.	Completeness of the learning information section in the AUMDROID application	5	Very Valid
8.	Completeness of the career information section in the AUMDROID application	5	Very Valid
9.	Suitability of the 4 dimensions of the Guidance and Counseling with the 11 aspects of the SKKPD and developmental tasks in the AUMDROID application	5	Very Valid
10.	Conformity of the AUM section with the 11 aspects of the SKKPD and developmental tasks in the AUMDROID application	5	Very Valid
11.	Conformity of AUM problem items with the 11 aspects of the SKKPD and developmental tasks in the AUMDROID application	4	Very Valid
12.	Availability of options for describing student problems in the AUMDROID application	5	Very Valid
13.	Availability of writing options for other problems faced by students in the AUMDROID application	5	Very Valid
14.	Availability of consultation options for students in the AUMDROID application	5	Very Valid
15.	Availability of options for students' consultation purposes in the AUMDROID application	5	Very Valid
16.	Completeness of student access menu material in the AUMDROID application	5	Very Valid
17.	Completeness of school counselor access menu material in the AUMDROID application	5	Very Valid
18.	Completeness of user manual menu material in the AUMDROID application	5	Very Valid
19.	Completeness of information menu material in the AUMDROID application	5	Very Valid
20.	Overall material in the AUMDROID application	5	Very Valid
	Total Score	**98**	
	Percentage	**98%**	

Table 5. Results of Validation on the Product Testing Instrument for Students

No	Indicator	Score	
		Validator 1	**Validator 2**
1.	I find it very easy to understand the AUMDROID application.	5	5
2.	I find it very easy to use the AUMDROID application.	5	5
3.	I find it very easy to access the AUMDROID application at any time.	5	5
4.	I find it very easy to access the AUMDROID application from anywhere.	5	5
5.	I find the AUMDROID application helpful.	5	5
6.	I find it very easy to access the AUMDROID application on my smartphone and tablet.	5	5
7.	I feel very satisfied with the complete menu featured in the AUMDROID application.	5	5
8.	I feel very satisfied with the design and content of the AUMDROID application.	5	5
9.	With the AUMDROID application, I can easily express my problems.	5	5
10.	Overall, I feel very satisfied with this AUMDROID application.	5	5
Total Score		**50**	**50**
Percentage		**100%**	**100%**
Overall Percentage		**100%**	

b. Design Revision

Revision is performed based on the feedback provided by the experts. The product being developed is revised if weaknesses are found to improve its quality. However, development continues to the product testing stage if no weaknesses are found. Results of expert validation showed that the AUMDROID application met the "Very Good" criteria, allowing the development to continue to the next stage.

c. Product Testing

Product testing involved six school counselors and 25 eleventh-grade TELI1 students at SMKN 10 Makassar. The AUMDROID application was assessed using a scale, with each indicator receiving a score. At this stage, the product was introduced, the procedure to complete the questionnaires was explained, and the questionnaires were distributed.

Table 6. Results of Product Testing Assessment by the School Counselors

No	Respondents	Total Score	Achievement Level (%)	Information
1.	School Counselor 1	59	98.33	
2.	School Counselor 2	59	98.33	
3.	School Counselor 3	60	100	
4.	School Counselor 4	60	100	$(P = \dfrac{F}{N})$
5.	School Counselor 5	59	98.33	$P = 99.17\%$
6.	School Counselor 6	60	100	
Total			**595 (%)**	

The respondents were informed about the AUMDROID application, including its functionality and advantages. They were also briefed about how to fill in the questionnaires that had been confirmed as valid and feasible. After the questionnaires were distributed, the respondents completed and returned them to be analyzed.

1) Results of Product Testing (Practicality) Assessment by the School Counselors of SMKN 10 Makassar

Table 6 shows that the school counselors rated the AUMDROID application at 99.17%, indicating that the application is good and

practical.

2) Results of Product Testing (Practicality)

Assessment by the Students of SMKN 10 Makassar

Table 7. Results of Product Testing Assessment by the Students

No.	Respondents	Total Score	Achievement Level (%)	Information
1.	Student 1	49	98	
2.	Student 2	48	96	
3.	Student 3	47	94	
4.	Student 4	48	96	
5.	Student 5	49	98	
6.	Student 6	49	98	
7.	Student 7	48	96	
8.	Student 8	49	98	
9.	Student 9	48	96	
10.	Student 10	49	98	
11.	Student 11	50	100	
12.	Student 12	48	96	
13.	Student 13	49	98	$(P = \dfrac{F}{N})$
14.	Student 14	48	96	P = 97.12%
15.	Student 15	49	98	
16.	Student 16	49	98	
17.	Student 17	48	96	
18.	Student 18	49	98	
19.	Student 19	48	96	
20.	Student 20	49	98	
21.	Student 21	50	100	
22.	Student 22	48	96	
23.	Student 23	49	98	
24.	Student 24	47	94	
25.	Student 25	49	98	
Total			**2428 (%)**	

Table 7 illustrates that the students rated the AUMDROID application at 99.17%, indicating that the application is good and practical.

This study's results align with previous findings by (Gudykunst, 1998). (Setyana & Purwoko, 2018). In their study, the material expert rated the content of the Android-based AUM application at 97.1%, indicating a very good level, and the instruction book at 95%. The media expert rated the application at 91.4%, indicating a good level, and the instruction book at 82.5%. The field experts (counselors) rated the application at 96.1%, indicating a very good level, and the instruction book at 93.75%. That application had been revised based on the feedback, comments, and suggestions from the material, media, and field experts. Therefore, the Android-based AUM application was very good and met the acceptability criteria.

d. Product Revision

Results of product testing assessments were utilized for product revision. Based on results of assessments by the school counselors and students, the AUMDROID application met the "Very Good" criteria. These results facilitated the study's progression to the next stage.

e. Final Product

The final product is the AUMDROID application designed to support the guidance and counseling services at SMKN 10 Makassar. This application serves as an assessment instrument, leveraging digital technology, accessible on Android-based devices, such as smartphones, tablets, and emulators. This application is ready for large-scale use in the school.

It is a practical application because it is easy to operate and accessible on any Android-based devices, anytime and anywhere. The final product can be used by the school and accessed through this link:

https://drive.google.com/file/d/1dU0Jc9rlELj4P MkqXq_SxuhT0_pJqXFM/view?usp=sharing.

These results seem to be consistent with those obtained by (Kurniawan, 2017) who conducted a study on the development of an Android-based guidance and counseling introduction application. This application was developed to serve as a media of information about guidance and counseling for junior high school students.

Similarly, a study by Aini (2019) conducted a study on the development of an Android-based application for online guidance and counseling services. This study also developed an application that allows school counselors and students to have consultations, assessments, and evaluations online.

CONCLUSIONS AND SUGGESTIONS

There are some conclusions that can be drawn based on the results of the study.
1. Manually inputting and processing data on the General AUM application posed difficulties for the school counselors and consumed more time. The school has potential as it provides internet access that can be used by the school counselors to deliver guidance and counseling services. Therefore, it was considered necessary to develop an Android-based application, offering convenience and effectiveness in the assessments of guidance and counseling, as well as practicality in analyzing the students' problems.
2. The prototype produced is the initial product called the AUMDROID application. The development began with the establishment of the AUM instrument based on SKKPD and the developmental tasks, followed by creating the front page, creating a formula on Google, integrating Google Form with Google Site, connecting Google Sheet with Google Site, configuring the application setting, selecting the design and theme, setting and adding content, creating the application on appsgeyser.com, installing the application on the emulator, as well as checking and evaluating the application.
3. Validation results indicate that the AUMDROID application was confirmed as valid and very good, suggesting the feasibility for use at SMKN 10 Makassar. This application is also practical because it is

easy to operate, can be accessed anytime and anywhere, and can work on any Android-based smartphones, tablets, and emulators. The final product can be utilized in schools and can be obtained through this link:
https://drive.google.com/file/d/1dU0Jc9rlELj4P MkqXq_SxuhT0_pJqXFM/view?usp=sharing.

Suggestions are also provided.
1. It is recommended that this AUMDROID application is optimally used at SMKN 10 Makassar to facilitate the guidance and counseling services and serve as a digital assessment instrument.
2. Further studies could also be conducted to test the AUMDROID application on different locations to increase the possibility of mass production.
3. Further studies might use this study as a reference when developing an Android-based problem expressing tool application that is practical, effective, complete, and attractive.

REFERENCES

Abdillah, H. (2022). Model Pelaksanaan Bimbingan Konseling Berbasis Teknologi Informasi dan Komputer Bagi Siswa Berkebutuhan Khusus. *COMSERVA: Jurnal Penelitian Dan Pengabdian Masyarakat*, *2*(6), 792–801.

Asmadin, A., & Silvianetri, S. (2022). Need Asesmen Non Tes Bimbingan Dan Konseling Dalam Layanan Penempatan Dan Penyaluran Siswa. *Jurnal Pendidikan Dan Konseling (JPDK)*, *4*(5), 4654–4660.

Daulay, N. (2019). Urgensi Landasan Psikologi dalam Pelaksanaan Bimbingan dan Konseling di Era Globalisasi. *Al-Irsyad: Jurnal Pendidikan Dan Konseling*, *9*(1).

Evianti, N., Subekti, R., & Firmansyah, B. (2020). Pelatihan Pengolahan Alat Ungkap Masalah (AUM) Dengan Menggunakan Komputer Bagi Konselor Sekolah SMKN 62 Lenteng Agung. *Jurnal Pengabdian Teratai*, *1*(2), 303–307.

Gudykunst, W. B. (1998). Applying anxiety\uncertainty management (AUM) Theory to intercultural adjustment training. *International Journal of Intercultural Relations*, *22*(2), 227–250.

Hariyanto, E., & Mustafa, P. S. (2020). *Pengajaran remedial dalam pendidikan jasmani* (Vol. 3). Lambung Mangkurat

University Press.

Ifdil, I., & Ilyas, A. (2018). *Pengembangan dan Validasi Software Pengolahan Alat Ungkap Masalah Seri Umum (SP-AUM versi. 1).*

Ifdil, I., Sin, T. H., & Fadli, R. P. (2021). Tingkat Kepuasan Pengguna Aplikasi Pengolahan Alat Ungkap Masalah (AUM) berbasis Website ditinjau dari gender. *Suluah Bendang: Jurnal Ilmiah Pengabdian Kepada Masyarakat*, *21*(3), 350–355.

Ilfana, A. (2022). Kompetensi Supervisor Dalam Supervisi Guru Bimbingan Konseling (Suatu Tinjauan Studi Pustaka). *Jurnal Paedagogy*, *9*(1), 192–197.

Ilfana, A., & Herdi, H. (2022). Pemanfaatan Teknologi Informasi dan Komunikasi dalam Layanan Bimbingan dan Konseling di Sekolah: Problematika dan Solusinya. *Jurnal Paedagogy*, *9*(2), 241–247.

Imawanty, I., & Fransiska, A. B. (2019). Optimalisasi Asesmen dan Evaluasi Bimbingan dan Konseling dengan Memanfaatkan Aplikasi Formulir Daring Jotform. *Konvensi Nasional Bimbingan Dan Konseling XXI*, 129–135.

Istiâ, F. N., Arumsari, C., Imaddudin, A., Sugara, G. S., Nugraha, A., & Sulitiana, D. (2021). Pemanfaatan teknologi sebagai media pembelajaran dalam layanan bimbingan dan konseling di masa adaptasi kebiasaan baru. *PROSIDING SEMINAR NASIONAL LPPM UMP*, *2*, 235–238.

Kurniawan, T. (2017). *Pengembangan Aplikasi Pengenalan Bimbingan Dan Konseling Berbasis Android Sebagai Media Layanan Informasi Untuk Siswa Smp Negeri 3 Gresik.* State University of Surabaya.

Kusnandi, K. (2019). Mengartikulasikan Perencanaan Pendidikan di Era Digital. *Jurnal Wahana Pendidikan*, *6*(1), 1–14.

Prasetiawan, H., & Alhadi, S. (2024). Pemanfaatan media bimbingan dan konseling di sekolah menengah kejuruan muhammadiyah se-kota Yogyakarta. *Jurnal Kajian Bimbingan Dan Konseling*, *3*(2), 11.

Rahmi Ramadhani, D. (2020). Belajar dan Pembelajaran: Konsep dan Pengembangan. *Jakarta: Yayasan Kita Menulis.*

Safithry, E. A. (2018). *Asesmen Teknik Tes dan Non Tes.* IRDH.

Setyana, M. S., & Purwoko, B. (2018). *Pengembangan Software Aplikasi Aum Berbasis Android untuk Siswa Kelas X Sman 1 Gedangan.* State University of Surabaya.

Sugiyono. (2016). Metode Penelitian Kunatitatif Kualitatif dan R&D. *Alfabeta, Bandung.*

Triyono, T., & Febriani, R. D. (2018). Pentingnya pemanfaatan teknologi informasi oleh guru bimbingan dan konseling. *Jurnal Wahana Konseling*, *1*(2), 74–83.

Wahidah, N., Cuntini, C., & Fatimah, S. (2019). Peran dan aplikasi assessment dalam bimbingan dan konseling. *FOKUS (Kajian Bimbingan & Konseling Dalam Pendidikan)*, *2*(2), 45–56.